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A HYPERTEXT-BASED INTERNET-ASSESSABLE DATABASE FOR THE MSFC TECHNOLOGY TRANSFER OFFICE

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INTRODUCTION

There exists a continuing need to disseminate technical information and facilities capabilities from NASA field centers in an effort to promote the successful transfer of technologies developed with public funds to the private sector. As technology transfer is a stated NASA mission, there exists a critical need for NASA centers to document technology capabilities and disseminate this information on as wide a basis as possible. Certainly local and regional dissemination is critical, but global dissemination of scientific and engineering facilities and capabilities gives NASA centers the ability to contribute to technology transfer on a much broader scale. Additionally, information should be disseminated in a complete and rapidly available form.

To accomplish this information dissemination, the unique capabilities of the Internet are being exploited. The internet allows wide scale information distribution in a rapid fashion to aid in the accomplishment of technology transfer goals established by the NASA/MSFC Technology Transfer Office. Rapid information retrieval, coupled with appropriate electronic feedback, allows the scientific and technical capabilities of Marshall Space Flight Center, often unique in the world, to be explored by a large number of potential benefactors of NASA (or NASA-derived) technologies. Electronic feedback, coupled with personal contact with the MSFC Technology Transfer Office personnel, allows rapid responses to technical requests from industry and academic personnel as well as private citizens.

The remainder of this report gives a brief overview of the Mosaic software and a discussion of technology transfer office and laboratory facilities data that has been made available on the Internet to promote technology transfer.

Introduction To Mosaic

MOSAIC is a distributed hypermedia system, available on most all modern computing platforms, which has been designed to allow information access over the Internet. This information may currently take the form of text data, images, animations, database queries, etc. In this sense, the system may be viewed as a Internet-based multimedia system. MOSAIC provides a unified interface to various network protocols, data formats, and information archives available on the Internet. The unified interface allows even novice computer users to effectively browse the internet, through hypertext sensitive documents, to discover, use, and share information.

Data sent from Internet servers to clients (in most cases a PC, Macintosh, or workstation running MOSAIC) are termed documents. Documents may contain plain text, inlined graphics, sound, other multimedia data, or hyperlinks to other documents. These documents may be located anywhere on the Internet. In MOSAIC, a hyperlink typically takes the form of an underlined phrase or a highlighted graphic. These hyperlinks, when clicked on with a mouse, causes the client to connect to a specified document, located anywhere on the Internet, and to retrieve and display the referenced document.

Initial implementations of MOSAIC include functionality for display of plain text, formatted text and hypertext, inlined graphics, audio clips, and animation sequences. A graphical user interface includes numerous point-and-click style operations for document manipulation, editing, and network traversal. In addition to the native HTTP protocol support, MOSAIC provides protocol interfaces for common TCP/IP communication including FTP, NNTP, Gopher, Archie, X.500, and WAIS data sources. This functionality establishes MOSAIC as a powerful Internet browsing tool. An attractive feature of MOSAIC is that it is free and publicly available and distributable. MOSAIC is available via anonymous ftp from `ftp.ncsa.uiuc.edu`.

Technology Transfer Data

The data included in the database from the Technology Transfer Office includes an overview of the office, a description of the mission of the office, and ways to works with the office. Specifically, the database describes memoranda of understanding with numerous regional states, industrial visits by MSFC technology transfer personnel, and site visits of Marshall Space Flight Center. Also included is data describing the patent licensing process and example technology transfer "success stories" from MSFC. A snapshot of a portion of the technology transfer "home page" is shown in Figure 1.

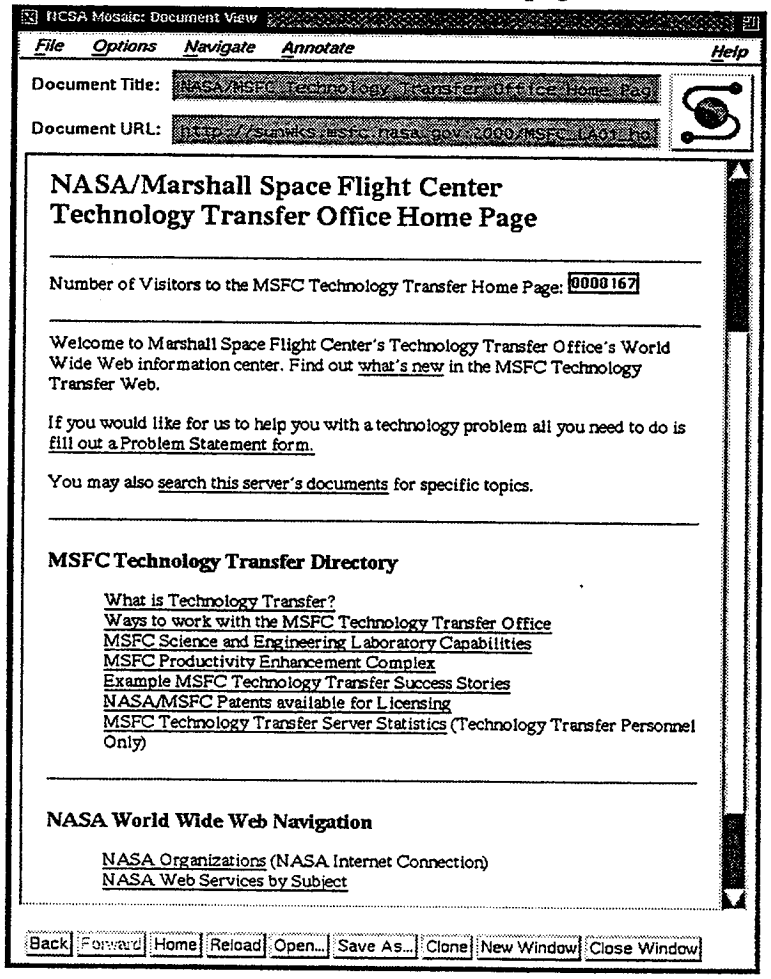

Figure 1. NASA/MSFC Technology Transfer Office Mosaic Home Page.

MSFC Science and Engineering Laboratory Capabilities

An overview of major science and engineering and laboratory capabilities available at MSFC is also included in the database. These laboratories include: Astrionics, Propulsion, Space science, Structures & Dynamics, Materials & Processes, Mission Operations, and Systems Analysis & Integration. The database describes primary missions for each lab, areas of current research, and example technology capabilities. Included in the database are images representative of ongoing developments in the laboratories. A snapshot of the MOSAIC screen for the Solid Propulsion Test Assembly, as a part of the Propulsion Lab, is shown in Figure 2.

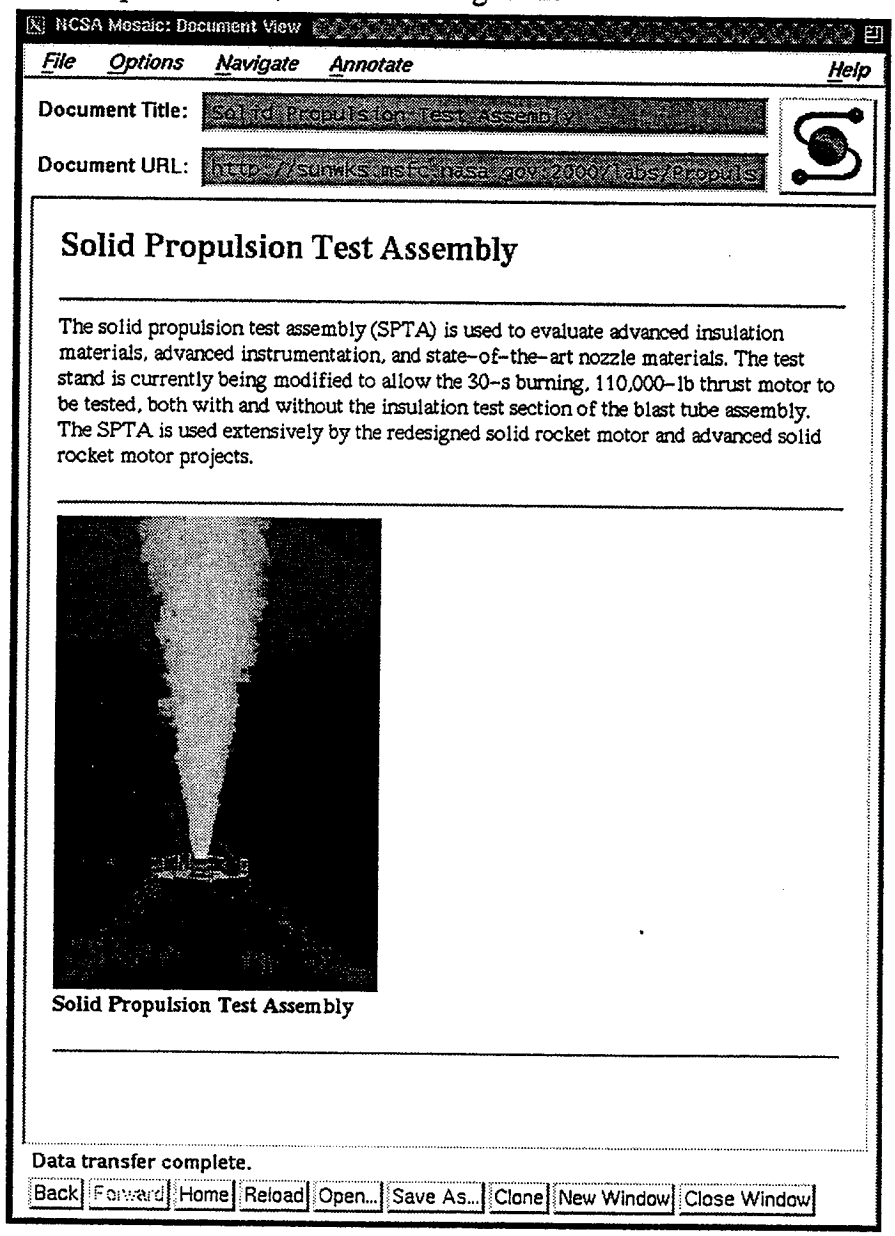

Figure 2. MOSAIC Screen Snapshot of the Solid Propulsion Test Assembly.

The Productivity Enhancement Complex

The unique capabilities of the Productivity Enhancement Complex are also described in the developed database. These capabilities include research, facilities, and MSFC personnel with technical capabilities in the fields of Coatings, Composites, Metals Processing, Robotics, Testing & Evaluation procedures, Insulations, and Engineering Support. One example technology described in the Metals Processing field is the Variable Polarity Plasma Arc Welding process. The database "page" for this technology is shown in Figure 3.

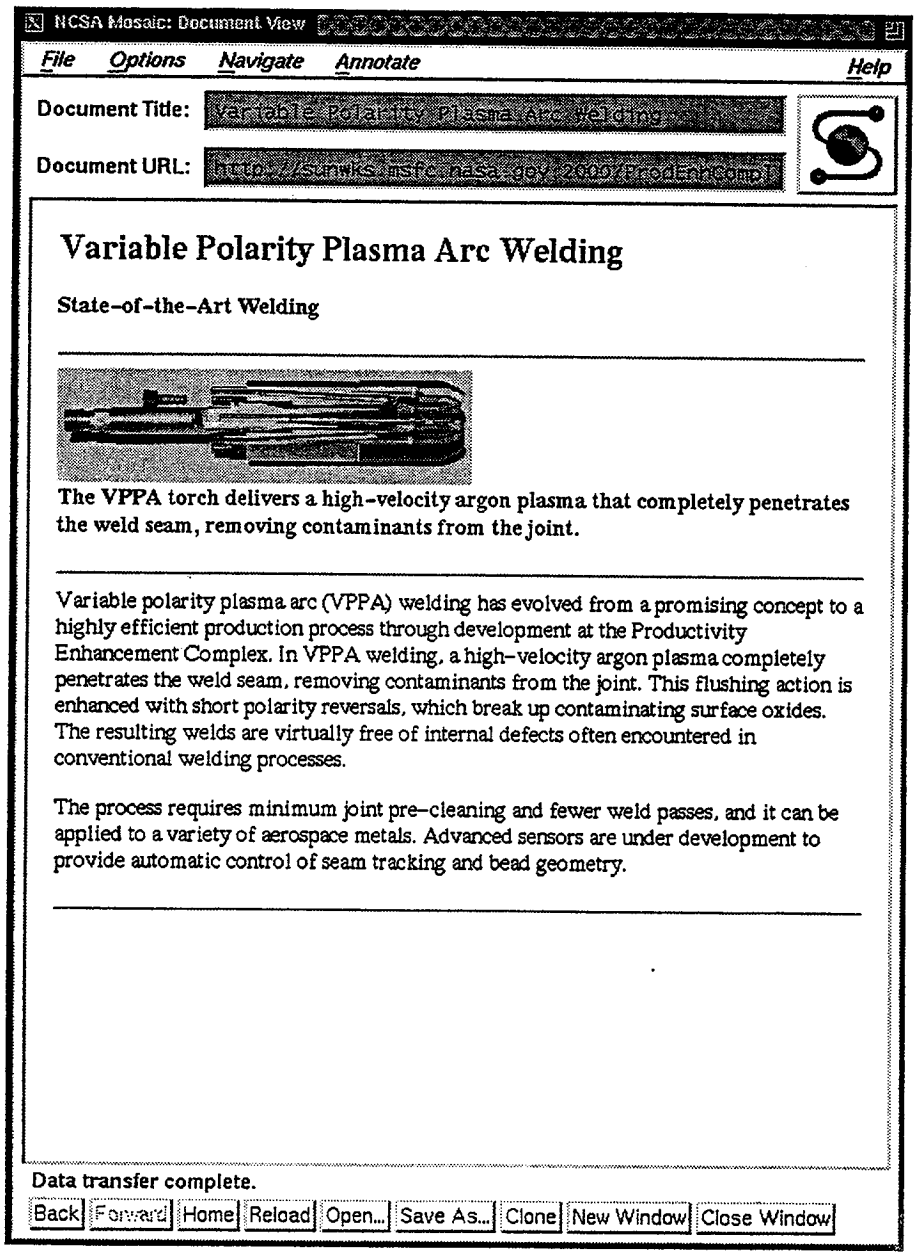

Figure 3. MOSAIC Screen Snapshot of the VPPA Welding Process.

The portion of the database describing the Productivity Enhancement Complex (PEC) contains a description of the 30 research cells including images of research equipment, facility operation, and a description of typical research investigations conducted by PEC personnel.

Additional Database Capabilities

An addition to previously mentioned data content and database capabilities, the database also provides interactive feedback between the user, a potential benefactor of MSFC technology, in the form of an electronic problem statement form. This form, when filled in by the user through the MOSAIC software, may be electronically submitted the MSFC Technology Transfer personnel. The data is transparently converted to the form of an email submission.

The database also supports a search query of all "pages" within the database based on a user specified search term. The database returns a list of documents, in a hyperlink format, that match the keyword specified. This feature allows the potential user to quickly locate information about specific technologies of interest.

Finally, the database supports the generation of access statistics reports to allow MSFC Technology Transfer Office personnel to establish metrics concerning use of the database thereby measuring its potential as a technology transfer tool.

Conclusions and Future Research

The Internet, and particularly the MOSAIC browser, offers a new source for information dissemination, a vital component of the technology transfer process. Rapid availability and wide spread access are significant advantages to describing the technology transfer process, facilities, and capabilities in this database form. Continuing developments include enhancement and expansion of the existing database, inclusion of additional scripts for generating metrics data, and an expansion of this form of information dissemination to a full scale multimedia demonstration of MSFC technologies and capabilities. This format would be particularly effective for field demonstrations of MSFC technologies by Technology Transfer personnel.

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